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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,870	10/19/2001	Robert Boesnecker	32860-000181	8899

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EXAMINER	
FAULK, DEVONA E	

ART UNIT	PAPER NUMBER
2644	6

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,870	BOESNECKER, ROBERT	
	Examiner	Art Unit	
	Devona E. Faulk	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because Figure 1, the measurement microphone, which is referenced to as (7) in the specification (page 6, paragraph 29) is referenced to by "6 1". Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1,2 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Op De Beek et al. (U.S. Patent 4,628,530) in view of Azima et al. (U.S. Patent 6,522,760) in further view of Meyer et al. (U.S. Patent 5,377,274).

6. Regarding **claim 1**, Op De Beek discloses a automatic equalization system with DFT and FFT (Figure 1) comprising a loudspeaker (6) (column 8, lines 56-60), which reads on "emitting sound by at least one coil stimulated to oscillate electrically by a sound source"; a frequency analyzing unit (16); an equalizing unit (4) that may be digital or analog (column 2, lines 46-64) and is set to a frequency response which is the inverse of the frequency characteristic of the acoustic signal detected by the pick-up means. Op De Beek further teaches that the equalizing unit (4) is constructed to correct the frequency characteristics and deliver the corrected signal to the output 9 (column 8, lines 45-51), which reads on "compensating for the frequency response of the flat surface loudspeaker by the filter device". Although he teaches on the above name elements, Op De Beek fails to teach of as flat loudspeaker. However, the concept of a flat loudspeaker was well known in the art as taught by Azima. Azima discloses a flat loudspeaker. Although he teaches on the above name elements, Op De Beek fails to teach of the frequency analyzer measuring the frequency response of the loudspeaker. However the concept of a frequency analyzer measuring the acoustic frequency response of a speaker was well known in the art at the time of filing as taught by Meyer. Meyer discloses a spectrum analyzer (16) that observes the amplitude versus frequency response of the transducer (column 8, lines 56-61). Modifying Op De Beek's apparatus by incorporating Meyer's analyzer also observe the amplitude versus frequency response of the transducer would read on " measuring the acoustic frequency of this flat surface loudspeaker", "determining a frequency curve", "

determining an inverse frequency curve to the frequency curve". Thus it would have been obvious to one of ordinary skill in the art to modify Op De Beek's apparatus by incorporating Meyer's spectrum analyzer and Azima's concept of a flat speaker for the benefit of better a flat loudspeaker for the benefit of producing acoustically acceptable effective distribution. And achieving optimized amplitude and phase responses.

Claim 2 claims the method of claim 1 with the exception that the transfer function of the filter device is simulated by digital filters. As stated above apropos of claim 1 the combination of Op De Beek and Meyer meets all elements of that claim. Therefore, the combination meets all elements of claim 2 with the exception of the claimed matter. Op De Beeks apparatus is to be implemented with DFTs and FFTs. This implies that any filter processing that is done is digital. Thus it would have been obvious to one of ordinary skill in the art to have the transfer function simulated by digital filters for the benefit of providing better equalization and providing an output signal with less distortion.

Claim 14 claims the method of claim 1, wherein at least one of oscillating coil has predetermined material characteristics. As stated above apropos of claim 1, the combination of Op De Beek and Meyer meets all elements of that claim. Therefore, the combination meets all elements of claim 14 with the exception of the claimed matter. A coil is obviously present in a loudspeaker and it is obvious that it has some predetermined material characteristics. All elements of claim 14 are comprehended by claim 1. Therefore, claim 14 is rejected for reasons given above apropos of claim 14.

7. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Op De Beek et al. (U.S. Patent 4,628,530) in view of Azima et al. (U.S. Patent 6,522,760) in view of Meyer et al. (U.S. Patent 5,377,274) in further view of Yashima et al. (GB 2 289 185).

Claim 3 claims the method of claim 2, wherein the transfer function is formed by FIR (Finite Impulse Response filter), whose filter coefficients are derived from the inverse frequency curve. As stated above apropos of claim 2, the combination of Op De Beek and Meyer meets all elements of that claim. Therefore, the combination meets all elements of claim 2 with the exception of the claimed matter. Yashima teaches of the coefficient data of a non-recursive digital filter is set to the transfer function (H3), which represents the inverse characteristics of the frequency-amplitude characteristic (page 18, lines 11-18). Non-recursive digital filter is alternative terminology for FIR filter. Thus it would have been obvious to one of ordinary skill in the art to use Yashima's concept of a transfer function formed as claimed for the benefit of matching the acoustic radiation characteristic of the sound source to the replay characteristics of the speaker.

8. **Claim 4,5,6 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yashima et al. (GB 2 289 185) in view of Azima et al. (U.S. Patent 6,522,760).

Regarding **claim 4**, Yashima discloses an apparatus for reducing distortion in horn-loaded speakers comprising a speaker (4) which reads on "at least one oscillating coil, mounted on a surface which, when stimulated by electrical sound signals, causes this surface to oscillate in order to emit sound". This is an obvious feature of a loudspeaker. He further teaches of a transfer function (H2) in block (102) that represents the inverse characteristic of the frequency-amplitude characteristic of the speaker (page 18, lines 10-14), which reads on "a filter device for

the sound signals, connected upstream of the at least one oscillating coil, wherein a transfer function of the filter device is the inverse of a frequency response of the flat surface loudspeaker". It is obvious that the transfer function (H2) is the algebraic representation of a filter. Although he teaches on the above named elements, Yashima fails to disclose a flat loudspeaker. However, the concept of a flat loudspeaker was well known in the art as taught by Azima. Azima discloses a flat loudspeaker. Thus, it would have been obvious to one of ordinary skill in the art to use Azima's concept of a flat loudspeaker for the benefit of producing acoustically acceptable effective distribution.

Claim 5 claims the flat surface loudspeaker of claim 4 wherein the filter device is in the form of a digital filter. Yashima teaches that the transfer function (H2) that represents the inverse characteristic of the frequency-amplitude characteristic of the speaker. Therefore, the filter is obviously digital. All elements of claim 5 are comprehended by claim 4. Therefore, claim 5 is rejected for reasons given above apropos of claim 4.

Claim 6 claims the flat surface loudspeaker of claim 5 wherein the filter device is formed by FIR (Finite Impulse Response) filters. As stated above apropos of claim 5, Yashima meets all elements of that claim. Therefore, Yashima meets all elements of claim 6 with the exception of the claimed matter. A FIR filter has a constant group delay irrespective of a change in the frequency-amplitude characteristic. It is obvious therefore, to use a FIR filter as the filter device. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use a FIR filter as the filter device in order to maintain stability at all frequencies.

Claim 16 claims the flat surface loudspeaker of claim 4, wherein at least one oscillating coil has predetermined material characteristics. As stated above apropos of claim 4, Yashima

meets all elements of that claim. A coil is inherently present in a loudspeaker and it inherently has predetermined material characteristics. All elements of claim 16 are comprehended by claim 4.

9. **Claims 7 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yashima et al. (GB 2 289 185) in view of Azima et al. (U.S. Patent 6,522,760) in further view of Smith (GB 2 265 519).

Claim 7 claims the flat surface loudspeaker of claim 5 wherein the filter device includes a sample and hold element as the input element, connected via an analogue-to-digital converter to the digital filter, whose output is connected to a digital-to-analogue converter. As stated above apropos of claim 5, Yashima meets all elements of that claim. Therefore, Yashima meets all elements of claim 7 with the exception of the claimed matter. Smith teaches of a re-linearising device (Figures 5 and 6) having a digital format converter (filter) and a memory (sample and hold element) connected as claimed (page 4, lines 8—19). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Smith's concept of a filtering device for the benefit of rescaling the incoming signal to five a displacement, which is proportional to the input signal.

Claim 9 claims the flat surface loudspeaker of claim 6, wherein the filter device includes a sample and hold element as the input element, connected via an analogue-to-digital converter to the digital filter, whose output is connected to a digital-to-analogue converter. As stated above apropos of claim 6, Yashima meets all elements of that claim. Therefore, Yashima meets all elements of claim 7 with the exception of the claimed matter. Smith teaches of a re-linearising device (Figures 5 and 6) having a digital format converter (filter) and a memory

(sample and hold element) connected as claimed (page 4, lines 8—19). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Smith's concept of a filtering device for the benefit of rescaling the incoming signal to five a displacement, which is proportional to the input signal.

10. **Claims 8-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yashima et al. (GB 2 289 185) in view of Azima et al. (U.S. Patent 6,522,760) in further view of Tanaka (U.S. Patent 5,081,604).

Claim 8 claims the flat surface loudspeaker of claim 5 wherein the filter device is equipped with a digital signal processor. As stated above apropos of claim 4, Yashima meets all elements of that claim. Therefore, Yashima meets all elements of claim 8 with the exception of the claimed matter. Tanaka teaches that an FIR digital filter is designed to execute digital filtering operations in order to provide a desired frequency-amplitude characteristic by using a digital signal processor (column 1, lines 42-53). Thus it would have been obvious to use Yashima's concept of a filter equipped with a digital signal processor in order to provide the ability to perform digital operations.

Claim 10 claims the flat surface loudspeaker of claim 6, wherein the filter device is equipped with a digital signal processor. As stated above apropos of claim 6, Yashima meets all elements of that claim. Therefore, Yashima meets all elements of claim 10 with the exception of the claimed matter. Tanaka teaches that an FIR digital filter is designed to execute digital filtering operations in order to provide a desired frequency-amplitude characteristic by using a digital signal processor (column 1, lines 42-53). Thus it would have been obvious to use

Yashima's concept of a filter equipped with a digital signal processor in order to provide the ability to perform digital operations.

Claim 11 claims the flat surface loudspeaker of claim 7, wherein the filter device is equipped with a digital signal processor. As stated above apropos of claim 7, the combination of Yashima and Smith meets all elements of that claim. Therefore, the combination meets all elements of claim 11 with the exception of the claimed matter. Tanaka teaches that an FIR digital filter is designed to execute digital filtering operations in order to provide a desired frequency-amplitude characteristic by using a digital signal processor (column 1, lines 42-53). Thus it would have been obvious to use Yashima's concept of a filter equipped with a digital signal processor in order to provide the ability to perform digital operations.

Claim 12 claims the flat surface loudspeaker of claim 9, wherein the filter device is equipped with a digital signal processor. As stated above apropos of claim 9, the combination of Yashima and Smith meets all elements of that claim. Therefore, the combination meets all elements of claim 12 with the exception of the claimed matter. Tanaka teaches that an FIR digital filter is designed to execute digital filtering operations in order to provide a desired frequency-amplitude characteristic by using a digital signal processor (column 1, lines 42-53). Thus it would have been obvious to use Yashima's concept of a filter equipped with a digital signal processor in order to provide the ability to perform digital operations.

11. **Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Op De Beek et al. (U.S. Patent 4,628,530) in view of Azima et al. (U.S. Patent 6,522,760) in view of Meyer et al. (U.S. Patent 5,377,274) in further view of Tagami (U. S. Patent 6,259,800).

Claim 13 claims the method of claim 1, wherein at least one of oscillating coil is mounted on a surface to form a plate. As stated above apropos of claim 1, the combination of Op De Beek and Meyer meets all elements of that claim. Therefore, the combination meets all elements of claim 13 with the exception of the claimed matter. Tagami discloses a speaker having a coil mounted on a vibrating plate (column 4, lines 17-19). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Tagami's concept of mounted the coil on a surface in the form of a plate in order to produce better acoustic characteristics.

12. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yashima et al. (GB 2 289 185) in view of Azima et al. (U.S. Patent 6,522,760) in further view of Tagami (U. S. Patent 6,259,800).

Claim 15 claims the flat surface loudspeaker of claim 4, wherein at least one oscillating coil is mounted on a surface in the form of a plate. As stated above apropos of claim 4, Yashima meets all elements of that claim. Therefore, Yashima meets all elements of claim 15 with the exception of the claimed matter. Tagami discloses a speaker having a coil mounted on a vibrating plate (column 4, lines 17-19). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Tagami's concept of mounted the coil on a surface in the form of a plate in order to produce better acoustic characteristics.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 703-305-4359. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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